DOCUMENT RESUME

ED 362 696 CE 064 713

TITLE	Greenville ISD. Integrated Lesson Plans.
INSTITUTION	East Texas State Univ., Commerce. Educational Development and Training Center.
SPONS AGENCY	Texas Education Agency, Austin.
PUB DATE	92
NOTE	46p.; For related documents, see CE 064 712-715.
AVAILABLE FROM	Educational Development and Training Center, East Texas State University, Commerce, TX 75429 (order no. INT-103-LP: $5).
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Academic Education; Behavioral Objectives; Communications; Competence; Competency Based Education; Curriculum Guides; Electronics; *Integrated Curriculum; *Interdisciplinary Approach; *Learning Activities; Lesson Plans; Mathematical Applications; Science Instruction; Secondary Education; Teaching Methods; *Vocational Education; Writing Instruction

ABSTRACT

This packet contains nine lesson plans for integrated academic and vocational education courses. Lesson plans for the following courses are included: industrial technology, automotive technology, English, mathematical applications, science, home economics, and mathematics. Some of the topics covered are as follows: mechanical drawing, automobile maintenance, job opportunities in the automotive field, research on contributors to a field, interpersonal skills, library skills, mathematics in daily living, the problem of solid waste, quilting, geometric figures, Cartesian coordinates, constructing a recipe box, and decimals. Lesson plans consist of lesson objectives, activities, presentation, information sheets, and evaluation. Lesson plan matrices showing lesson topic integration for each course is included in the packet. (KC)

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ED 362 696

Integrated Lesson Plans

Greenville ISD

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CE 064 713

Educational Development & Training Center
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ATD 906

Industrial Technology

First Week

I. Introduction
   1. Schedule
   2. Code of Conduct
   3. Grade Policy
   4. Parental permit to operate machinery

II. Safety
   1. ICCZ (2-1 to 2-5) students will read chapter and answer review questions. This is a preview of basic shop safety.
   2. Students will be introduced to the various pieces of equipment they will be operating.
   3. Students will be tested.

III. Students will be given a pretest over ruler reading.

Second Week

I. Drafting
   1. Students will read and answer review questions, *Mechanical Drawing* text, chapter 11. Working drawings pages 227-238. Students will be tested upon completion.
   2. Students will be introduced to dimensioning and begin drawings.
   3. Students will draw and dimension.
      a. Template 3-58
      b. Drawing 9-3
      c. Stencil 3-59
      d. As needed

Third Week

I. Students will begin work on their Trouble game. Students will design, engineer, draw, and build product.

Materials Needed

1.	Drafting equipment (on hand)	
2.	(1) 1x12x12"	1.50
3.	Marking pencils	3.00
4.	Polyurethane	3.00
5.	Sand paper	1.00
		$8.50 per student

Course Title: ATD 906 Academic Technical Discoveries (Industrial Technology)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
3 weeks	Working Drawings or Templates	75.85.24 75.85.26 75.85.29 75.85.6A 75.85.6B 75.85.6C 75.85.9A 75.85.10A 75.85.1B 75.85.10C 75.85.40 75.85.38 TAAS obj 1 obj 3 obj 4 obj 6 obj 11	Students will be able to to define a working drawing. Students will know the importance of accuracy when laying out parts. Students will be able to accurately draw and dimension a working drawing. Students will know how templates are used daily in industry. Students will take a pretest on ruler reading. Students will design and draw a Trouble game. Students will know proper shop safety techniques before beginning work on projects.	Text, M*echanical-Drawing*, Chapter 11, Page 227-238 Templates	Properly draw and dimension templates per scale. Design and draw a Trouble game. Build project

Automotive Technology
Steps for Teaching Lesson

1. Have students read Chapters 10, 62, and 63 in textbook, *Modern Automotive Mechanics* by James E. Duffey.
   Write definitions for and know the terms at the end of the chapter.
   Answer review questions at the end of the chapter.

2. Lecture using transparencies for clarification.

3. Have students do assignment sheet using key words.

4. Hold class discussion. Use student feedback to check for understanding.

5. Have students inspect tires for wear, remove tires from automobiles, rotate and replace tires.

Course Title: ADT 906 Academic Technical Discoveries (Auto Tech)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
5 days	1. Tire maintenance 2. Tire rotation 3. Tire wear 4. Aspect ratio 5. Rim width	75.91-all TAAS Domain concepts objective 4	Students will understand the fundamentals of automobile service and maintenance.	*Modern Auto Mechanics*, Chapter 10, 62, 63 Hunter Service literature GM, Chrysler, Ford manuals Curriculum Guide	Written Test Class discussion. Competency demonstration in lab

Automotive Technology
Steps for Teaching Lesson

1. Have students read Chapter 19 in textbook, *Modern Automotive Mechanics* by James E. Duffey.
   Write definitions for and know the terms on page 232.
   Answer review questions on page 232.

2. Lecture using transparencies for clarification.

3. Have students do assignment sheet using key words.

4. Hold class discussion. Use student feedback to check for understanding.

5. Have students disassemble and reassemble carburetors in lab. Have students write a report on each step of the disassembly and reassembly process. Students must use outline and essay format.

Course Title: ADT 906 Academic Technical Discoveries (Auto Tech)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
5 days	1. Float system 2. Idle system 3. Off-idle system 4. Acceleration system 5. High speed system 6. Full power system 7. Choke system	75.81-1 5, 6, 8	Students will understand the fundamentals of carburetion	*Modern Auto Mechanics*, Page 210 Delco Service literature GM, Chrysler. Ford manuals Curriculum Guide	Written test Class discussion Lab test

Automotive Technology
Steps for Teaching Lesson

1. Have students read Chapter 2 in textbook, *Modern Automotive Mechanics* by James E. Duffey.
   Write definitions for and know the terms at the end of the chapter.
   Answer review questions at the end of the chapter.

2. Lecture using transparencies for clarification.

3. Have students do assignment sheet using key words.

4. Hold class discussion. Use student feedback to check for understanding.

5. Have students work in groups of three to identify four different job settings offering employment in the automotive field. A job description, training requirements, and career advancement opportunities for each job should be written in a paper prepared by the group.

Course Title: ADT 906 Academic Technical Discoveries (Auto Tech)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resource	Evaluation Techniques
5 days	1. Nature of work 2. Places of employment 3. Training and qualifications 4. Career opportunities 5. NIASE program	75.91-all	Students will understand job opportunities in the automotive field.	*Modern Auto Mechanics*, Chapter 2 Newspaper articles Trade school brochures	Oral review Discussion Written report

English

Objectives:

- Research topics and share findings
- Practice recording facts clearly and logically
- Become more aware of significant contributions made in a particular field of study
- Learn to paraphrase and present information succinctly

In advance of the unit, the teacher will prepare a list of inventions and inventors to be covered in this unit. Duplicate the list, one for each student. Distribute the lists and explain the writing assignment. Students will be responsible for writing an essay in this unit, creating an award, and contributing to a class-generated game.

Activity for Understanding—I—One Day

One way of showing students how important inventors and inventions are in life is to have students experience an activity that is impossible to complete because they must complete the activity without an integral part. It would be a "what if" exercise. For example, give them small boxes and enough wrapping paper to cover the package. Tell them they must wrap the package using only the box and the paper. This then will lead to the introduction of J. Brandenberger, the man who invented cellophone tape.

For an easier example, turn off the air conditioning unit in your class room. "What if" W.H. Carrier had not invented air conditioning?

Activity for Understanding—II—One day

Through the use of encyclopedias and other reference books, have students read about different kinds of awards and the people who receive them.

Pulitzer Prize	Presidential Commendations
Noble Prize	Awards of Valor
Community Awards	Service Awards

Activity for Understanding—III—One day

Play Trivial Pursuit with the class, emphasizing sections based on achievements and people. (Baby Boomer Edition-Lives and Times) (Young Players, Science & Technology, People & Places) Activities I, II & III should be done prior to the part of the unit they emphasize.

Activity—IV—Four days

Each student will choose one invention/inventor from the list to research. Each student will be responsible for researching the inventor's life, the invention, and its affect on the 20th century. Students will use the prepared questionnaire and supply all the

information asked, then they will write their essay based on their information sheets. Students will present information about the invention/inventor at close of unit.

1st day:	Distribution of list and explanation of the assignment, activity for understanding and class discussion, distribution and explanation of research questionnaire
2nd day:	Library research time
3rd day:	Library research time
4th day:	In-class writing assignment based on research

Activity—IV—One day

Students will create original awards to give their inventors. These can be designed from computer programs, or other award-maker booklets. Some students may want to design the award free-hand.

After the completion of Activities IV and V, students should orally present their papers and the awards designed for the inventors. This should only take one class period as each presentation would be only 2-3 minutes.

Activity—VI—Two days

After students have collected all the research on the inventors and inventions, they should work together to create some type of board game that is developed around the works and the people. The game should develop around identities of authors, inventions, and key ideas.

After the completion of the game, have students play the game. This can be done several times during the cycle.

Evaluation

Give points or grades for quality of research and reporting.
Give points or grades for quality of awards.
Give points or grades for class participation and development of the game.

Course Title: ADT 906 Academic Technical Discoveries (English)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
7-10 days	Success with others	1A 1B 1C 1D 1G	Students will: 1. learn interviewing techniques. 2. Plan a job interview. 3. Cooperate with others to work as a team. 4. Develop skills necessary to become a "follower." 5. Develop skills necessary to become a "boss." 6. Write job descriptions. 7. Participate in discussions and debates. 8. Participate in a decision-making process. 9. Use graphic words. 10. Create a product to share with the world.	Workbook - *I Am Already Successful* Section II 9th grade - grammar text Teacher generated materials Games designed by teacher/students	Successful completion of interview(s) Written job descriptions Actual "product" development Describe a successful "follower" or "boss" and be sure to include five positive attributes described in this unit for each

Course Title: ATD 906 Academic Technical Discoveries (English)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
10 days	Research and development of reports Development of awards based on achievement Development of a board game based on critical thinking skills	1A 1C 1D 4G 4H	Student will research topics and share research findings. Students will practice recording facts clearly and logically. Students will study to become aware of significant contributions made in a particular field of study. Students will paraphrase and present information succinctly. Students will demonstrate library skills. Students will demonstrate presentation skills. Students will work in groups to develop product.	Teacher-generated list Reference material from library Trivial Pursuit Board Game	Proper presentation and writing of reports Quality of research and reporting Quality of designed awards and the information they cover Grade points for class participation Grade for the development of the board game Library skills

Invention/Inventor Topic List

Insulin — 1921, Banting & Best

Iron lung — 1927, P. Drinker

Electric blanket — Simmons Co.

Frozen food process — Clarence Birdseye

Jukebox — John C. Dunton

Lie detector — John A. Larson

Parking meter — Carlton Magee

Safety razor — King Camp Gilette

Television — John Logie Baird

Vacuum cleaner — Cecil Booth

Aerosol (a container pressurized by an inert gas)—

Air conditioning — W.H. Carrier

Powered aircraft — Wright Bros.

Aqualung — Jacques Cousteau

Bakelite (first plastic)— L.H. Backeland

Ball point pen — 1919, L. Biro

Cellophane (trade name) — 1908, J. Brandenberger

Sound film — 1923, L. B. DeForest

Freon — 1930, T. Midgley

Geiger Counter — 1913, J.H.W. Geiger

Holography — 1947, D. Gabor

Hovercraft — 1955, Sir C. Cockerell

Famous Interdisciplinarians

Once the students have finished the famous inventors study, they should feel comfortable using the library to find varied information. This lesson should be used as reinforcement so students can discover how knowledge from several fields of study is necessary in life achievements.

One week: Prominent world figures

Biographies

A. Charles de Gaulle
B. Harry S. Truman
C. Werner Von Braun
D. Caesar Chavez
E. Adolf Hitler
F. Dwight Eisenhower
G. Winston Churchill
H. Albert Einstein
I. Horatio Algier
J. Henry Ford
K. Eli Whitney
L. Washington Carver
M. Niki Giovani
N. Nadine Gordnier
O. John Glenn

Format to follow

Name
Birth date
Birthplace
Activities relating to world prominence—list
Date of death (if dead)
Cause of death (if dead)

Write a five-paragraph paper on major accomplishments, activities, involvements, etc, that made this individual worthy of remembrance. It will be important for you to show how this individual has experienced accomplishments in more than one academic/vocational field.

Course Title: ATD 906 Academic Technical Discoveries (English)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
2 days	World Prominence accomplished through the use of academic/vocational studies	4G	Students will use their library skills to research cross-training of prominent world figures, ex. John Glenn Science Government Technology	Teacher-generated list	Proper presentation of materials, i.e written report

When Will I Ever Use This Stuff?

Objective: Relate math to daily living

Time: Two class periods will be needed to complete interviews

Directions: Duplicate list of occupations whose workers use math on the job. Students will need to find someone they know who fits into one of these jobs or they may select another occupation. The student will contact this person and ask if they can interview them about their job and how math skills are used in their occupation. This may be a good lesson to practice brainstorming techniques to generate a job list.

Tell students the purpose of the interview is to discover specific ways in which math is essential to the person's job. This would be a good time to help student develop questioning skills. Help them construct questions that elicit a descriptive answer, rather than a yes or no.

Example: "Will you tell me about a time when having good math skills helped you with a mistake on your job?"

Establish a due date by which the interviews must be completed. On that date, provide students with poster boards and markers. Students will use the most interesting or vivid quotes of the interview and write those on the posters. Students will turn in their completed posters.

This work can then be posted in various classrooms around the school to illustrate the age-old question, "How will I use this later in life."

This exercise could be used for other subject areas, such as science, geography, English, etc.

Course Title: ATD 906 Academic Technical Discoveries (English)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
2 class periods will be needed to complete interviews	Relate math to daily living	4A - use specialized dictionaries 4G - use various reference materials 4H - make general--izations from a given series of assump-tions	Students will be able to formulate questions and conduct an interview. Students will develop questioning skills. Students will construct questions that elicit descriptive answers. Students will write for a purpose. Students will design and post art posters.	Teacher-generated list	Interview/questionnaire submitted Poster design

Science

I. What do we do with this trash?

A. Classroom activity to create interest
B. Cooperative learning
   1. sorting trash
   2. develop self interest groups
C. Draw map of journey of one object from the beginning to end (Follow up with same activity at the end of unit)

Integration Activities

A. Technology
   Select one piece of trash in the room and investigate the various technological processes and systems that created that artifact and brought it to school.
B. Math
   Plot increases in solid waste over the last 100 years in the U.S., and calculate per capita rates for selected years.
C. Home and Career Skills
   Investigate careers in solid waste management. Find out what type of high school preparation is required.

II. What is in a typical bag of trash?

A. Infer the contents
B. Classify the contents

Integration Activities

A. Technology
   Investigate the technological history of an artifact of trash from one of the bags.
B. Math
   Determine the mass and volume for selected objects from the trash bags used in activity.
C. Home and Career Skills
   Conduct a visual survey of litter in your local community by walking around and recording observations.

III. How much trash do we produce?

A. Individual collection (10 days)
B. Develop and implement plan to obtain data

Integration

A. Math
   Use the concepts of mean, media, and mode to analyze the class data set regarding residential solid waste generation.
B. Home and Career Skills
   Select a local business or manufacturing plant and see if you can obtain information about how much commercial/industrial waste it generates.

What is in the local landfill?

A. Plan field trip
B. Cooperative learning group topics
   1. alternative products or non-biodegradable trash items
   2. select other countries. How do they handle/manage trash?

Integration

A. Technology
   Keep a running list of the various types of technological devices, large and small, that you see in use at the landfill. Select one device and find out when it was invented, by whom, and for what purpose.
B. Math
   Obtain daily or weekly estimates of the amount of solid waste taken to the local landfill. Make projections about how long the landfill can operate under these conditions.
C. Language Arts
   Write a "bird's eye view" of your local landfill in which you describe its value and/or harm to local bird populations.
D. Home and Career Skills
   Ask a worker at the landfill about the type of education preparation necessary for employment.

Course Title: ATD 906 Academic Technical Discoveries (Science)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
3 weeks	Solid waste: Defining the problem	TAAS 4 5 10 12	Students will realize a local science-related issue is personally important. Students will generate a list of physical properties of materials and appropriately use these properties to classify objects. Students will develop and implement a plan to obtain data regarding an important local issue. Student will plan, carry out, and analyze their own learning experiences for a field investigation	Solid Waste: Is there a solution? N.Y. Sci., Tech, and Society Education project Library resources	Map drawing Essay Graphs

Course Title: ATD 906 Academic Technical Discoveries (Science)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
3 days	Should a landfill be constructed in our community?	75.44(a) 2A 4A 4B 10	Within the context of a simulation activity, students draw upon and apply diverse information and concepts about an environmental issue.	Solid Waste: Is there a solution?	Assigned role evaluation

Course Title: ATD 906 Academic Technical Discoveries (Science)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
2 days	How to choose a proper landfill environment	TAAS 4 5 10 12	On the basis of experimental evidence, students identify an optimal material for a technological application	Solid Waste: Is there a solution?	Lab write up

Home Economics

I. Introduction
   1. schedule
   2. code of conduct
   3. grading policy

II. History of quilting
   1. social activity
      A. family relations
      B. communication
   2. elderly resource person
      A. recollections
      B. demonstrations/tutors

III. Decision making process
      A. design of quilt
      B. colors in quilt
         1. color wheel
         2. pattern/solid combinations

IV. Designing
      A. planning design
      B. make templates

V. Construction
   1. cutting fabric
      A. grain
      B. seam allowances
      C. layout of templates
   2. assembling
      A. machine or hand
      B. efficient construction techniques

Course Title: ATD 906 Academic Technical Discoveries (Home Economics)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
4 weeks			Students will be able to relate the significance of quilting.		Paragraph
			Students will be able to recognize traditional quilt patterns.	Library	
			Students will be able to recognize different personalities in communication.	Text	Role play
			Students will be able to communicate with the elderly in ways that encourage them to share their experiences.	Resource person	
			Students will be able to use the decision making process.	Text	Write actual decision through style
			Students will design and draw a quilt pattern.		Draw design for quilt
			Students will be able to plan and cut quilt pieces.		Plan and cut quilt pieces
			Students will be able to assemble quilt by hand or machine		Construct quilt

Math

1 week

1. The students will be able to identify the common figures.
2. The students will be able to calculate the perimeter and area of these common figures.
3. The students will be able to show mastery of these skills through testing.

2 week

1. The student will be able to solve work-related problems that involve common figures.
2. The student will construct a pyramid using 2'x2' cardboard given a picture and dimensions in both metric and English measurement.
3. Student will:
   A. Name the type of common geometric figures included in the pyramid.
   B. Using the given measurements, find the total area of cardboard used in the construction of the pyramid.
   C. Remembering that a 2' x 2' piece of cardboard was used to construct the pyramid, find the total amount (area) of cardboard waste.

Course Title: ATD 906 Academic Technical Discoveries (Math)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
2 weeks	Geometric figures and calculating area and perimeter	TAAS Obj 3 Obj 6 Obj 7 Obj 8 Obj 11	Identify common figures such as rectangles, squares, triangles, parallelograms, trapezoids, and circles. Calculate the perimeter and area of common figures. Solve work-related problems that involve common figures. Use ruler to measure dimensions correctly using metric and English measure.	*Algebra I* Addison Wesley *Applied Mathematics* CORD Overhead Master/ *Applied Mathematics* CORD, unit 7 page 5 and page 19	Building of pyramid

Course Title: ATD 906 Academic Technical Discoveries (Math)

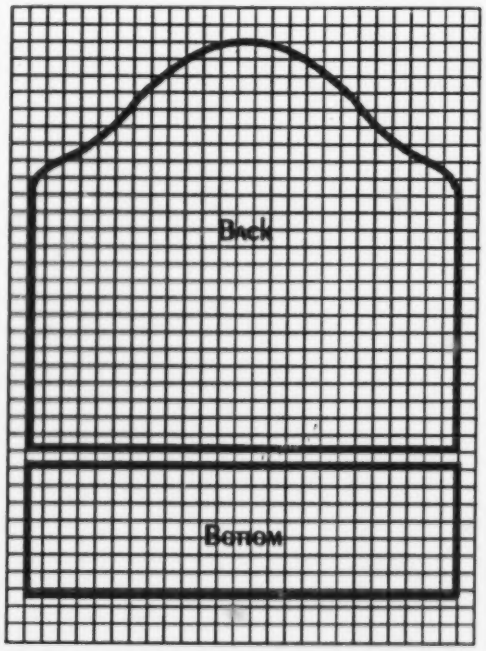
Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
1 week	Cartesian Coordinate System	Algebra I 3c TAAS Obj 11	Identify and define the elements of a Cartesian Coordinate System: ordered pair, x- and y- coordinates, x- and y- axes, quadrants, origin, abcissa, ordinate Identify and plot in a coordinate system. Use above concepts to enlarge a pattern and construct a finished product. **Activities** Making of the pattern 1. Divide both pattern grids into four-equal quandrants. 2. Label the points of all corners and the majority of the points on the curves with the appropriate ordered pair. 3. Divide large piece of graph paper into four equal quandrants. 4. Label the points found in step 2. 5. Connect the points to form enlarged pattern. Production of finished product 1. Cut out enlarged pattern 2. Trace on balsa wood 3. Using exacto knife, cut wood pieces. 4. Using hot glue connect pieces of balsa wood to form recipe box.	*Algebra I* Addison Wesley *Country Collectibles* Donner Eller Transparencies a. Cartesian coordinate system b. Coordinate plane Recipe box instruction sheet	Graphs Worksheets Project Test

Math
Recipe Box

Instruction Sheet

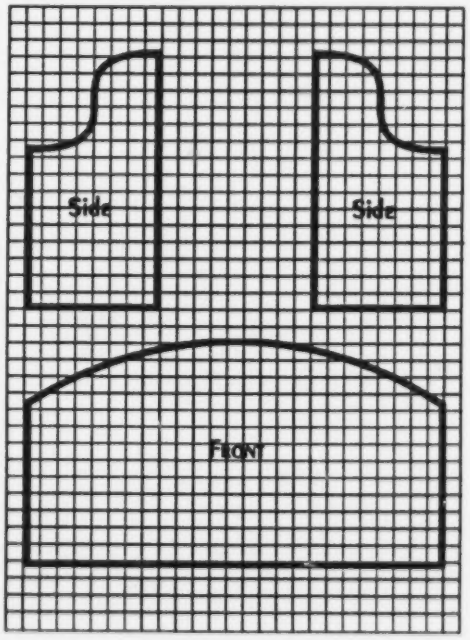
Making the Pattern

1. Divide both pattern grids into four equal quadrants.
2. Label the points of all corners and the majority of the points on the curves with the appropriate ordered pairs.
3. Divide large piece of graph paper into four equal quadrants.
4. Label the points found in step 2.
5. Connect the points to form enlarged pattern.



Production of Finished Product

1. Cut out enlarged pattern.
2. Trace on balsa wood.
3. Using exacto knife, cut out wood pieces.
4. Using glue (hot glue) connect pieces of balsa wood to form recipe box.



List of Material

1. Graph paper
2. Ruler
3. Scissors
4. Balsa wood
5. Exacto knife
6. Glue (hot glue if possible)

Course Title: ATD 906 Academic Technical Discoveries (Math)

Time Frame	Course Outline	Essential Elements	Instructional Objectives	Materials/ Resources	Evaluation Techniques
1 week	Operations involving integers and decimals	Mathematics of Money 2C Algebra 1D Economics 4E Common Voc Ed 75.85.5D TAAS obj 6, 7	Add/subtract positive and negative integers, and decimals. Use addition/subtraction of integers and decimals in a real-life problem solving situation involving money and banking. **Activities**: Complete the "Banking Is" by 1. Writing and stubbing checks and deposits as indicated 2. Recording every transaction on the check register 3. Reconciling a bank statement.	*Algebra I* Addison Wesley Booklet: "Banking Is" from National Learning Productions, Inc. Filmstrip "Banking Is"	Completion of "Banking Is" Test